ENERGY STAR® Set-top Box Program
Draft Specification
Version 1.0
December 6, 1999

The symbol for energy efficiency.

Below is the initial draft product specification for the ENERGY STAR Set-top Box Program. Per the requirements of the ENERGY STAR Program, a product must meet all of the identified criteria if it is to be qualified as ENERGY STAR compliant by its manufacturer.

1) Definitions: Below is a brief description of a set-top box and its common operational modes as relevant to the ENERGY STAR Program.

   A. Set-top Box: A commercially available electronic product encased in a single housing whose purpose is to receive and translate signals that are then sent to a television for viewing.

   B. Standby/Low-power Mode: The lowest power state that the set-top box product model enters while connected to a power source. In this mode, the product appears to be "off" to the user, but may be capable of responding to a signal (e.g., a signal sent from a head end or data provider) and may continue to perform some functions (e.g., remote control sensing and time readout).

   C. Active Mode: The mode in which the product is operational and has been turned "on" by the user. The product is connected to a power source and is receiving, sending, processing, translating, and/or recording signals. The power requirement in this mode is typically greater than the power requirement in standby/low-power mode.

   D. Disconnect: The mode in which the product is disconnected from all external power sources.

> *EPA Comments: Above are brief descriptions of common operational modes for set-top boxes that EPA has observed in field tests conducted by/for EPA. To achieve the maximum energy savings without compromising performance, the ENERGY STAR specification will focus on standby/low-power mode, which was the consensus at the July 1999 meeting between EPA and set-top box industry representatives in attendance. (See www.energystar.gov for list of attendees.) EPA has purposefully avoided defining various standby/low-power modes based on the functionality provided in each mode (e.g., standby-passive, standby-active, etc.) for two reasons: 1) recognition of the variation in modes and functionality across product categories, and 2) desire to encourage simplicity in program design and implementation.*

2) Qualifying Products: For the purposes of this Program, set-top box products include the following: analog cable TV set-top boxes, digital TV converter set-top boxes, Internet access devices, video game consoles, videophone set-top boxes, digital cable TV set-top boxes, Direct Broadcast Satellite (DBS) systems, and personal video recorders and other devices with hard drive functionality (e.g., TiVo and Replay TV).

EPA Comments: EPA's interest in developing energy-efficiency guidelines for set-top boxes is driven by the following factors: 1) a large and growing installed product base, 2) expectations of significant market growth, 3) evidence of considerable energy use when products are "off" (nearly equal to the amount needed in the primary function), 4) the potential for more energy-efficient design based on engineering analysis and manufacturer feedback, and 5) changing distribution and usage patterns that will provide consumers with more opportunities to choose energy-efficient models.

Given that these products share many common design characteristics and it is administratively more efficient to maintain one versus several ENERGY STAR Programs, EPA intends to cover a variety of products under one Set-top Box Program.

3) Efficiency Specifications for Qualifying Products: Only those products listed in Section 2 that meet the specifications outlined in Table 1 below may qualify as ENERGY STAR compliant. Products with more than one function may qualify for the label under the product category below that best reflects how they are marketed and sold to the consumer.

Table 1: DRAFT Criteria for ENERGY STAR–compliant Set-top Boxes

Product Category	**Standby/Low-power Mode**
• Analog Cable TV Set-top Box • Digital TV Converter Set-top Box • Internet Access Device • Video Game Console • Videophone Set-top Box	≤ 1 Watt
• Digital Cable TV Set-top Box • Direct Broadcast Satellite (DBS) System • Personal Video Recorder & other devices with hard drive functionality	≤ 8 Watts

EPA Comments: Based on a technical review of existing products and discussions with manufacturers, EPA feels that a 1 Watt standby/low-power mode specification for analog cable boxes, digital TV converter set-top boxes, Internet access devices, video game consoles, and videophones is challenging, reasonable, and technology-neutral. Within this category, some models currently on the market meet the specification and additional evidence indicates that more models will meet the specification as manufacturers release new designs. In other words, EPA believes that some products available today meet the specification and, for those that do not, a realistic goal has been set for them to do so at a later date. Switching power supplies that minimize power loss during low-load operation, flash memory, and low-power single chip tuner technologies are design options that manufacturers might consider to produce products that meet the proposed specification.

Regarding digital cable TV set-top boxes, DBS systems, and personal video recorders, EPA has proposed a less stringent specification of 8 Watts or less due to the design influence of service providers and the relatively recent introduction of these products to the marketplace. In addition, an 8-Watt specification is comparable to criteria currently under development by the Group for Efficient Appliances (GEA). ***(Cont.)***

EPA Comments (cont.): While not included in this draft, EPA is considering the development of a Tier or Phase 2 specification (similar to the approach in the Home Audio/DVD MOU). As product convergence continues, EPA believes that it will be both desirable and necessary to develop one specification for all set-top boxes. Industry comments are encouraged.

Please note that the primary objective of the ENERGY STAR Programs is to recognize the most energy-efficient products in the market through the use of the ENERGY STAR label. It is not EPA's intention to design a specification that will allow every model to qualify for the label. EPA believes that this draft specification will recognize a reasonable sub-set of the marketplace.

4) Power Measurement: The power requirement shall be measured from the outlet or power supply source to the product under test. The product manufacturer (i.e., ENERGY STAR Partner) shall measure the average true power (in Watts) of the product. When performing measurements to self-certify a product model, the products under test must be in the condition (e.g., configuration and settings) shipped to the customer. The test method to be used by manufacturers to self-certify their product(s) for ENERGY STAR compliance will likely be consistent with the Testing Guidelines for the ENERGY STAR® Home Electronics Program. Manufacturers are invited to provide comments and/or suggestions on the test method.

5) Other Information: The *final* version of the ENERGY STAR set-top box specification will be provided in the standard Memorandum of Understanding (MOU) format. In addition to the product specifications, other issues will be addressed such as the following.

- Buyer Information: In keeping with the spirit of the ENERGY STAR Program, the Partner will be expected to ensure that consumers have a quick and easy method of determining which of its products are ENERGY STAR compliant. To achieve this goal, EPA recommends that the Partner place the ENERGY STAR logo on all qualified product models, their packaging, and product-related materials such as brochures, manuals, advertisements, and Web sites. Further, to educate consumers about energy efficiency and its benefits, the Partner will provide one or more of the following: a description of the ENERGY STAR Program, a discussion of the energy-saving characteristics of the product, a description of the environmental benefits that result from the energy saved by the product, and/or a description of the potential energy-bill savings of the product. The Partner may determine the best manner to disseminate this information to customers.

- Effective Date: The date that manufacturers may begin to qualify products as ENERGY STAR compliant will be defined as the *effective date* of the MOU. This date is subject to negotiation with industry.

- Future Specification Revisions: EPA reserves the right to change the specifications should technological and/or market changes affect its usefulness to consumers, industry, or the environment. In keeping with current policy, revisions to the specifications are arrived at through industry discussions.

<u>EPA Comments</u>: In order to focus EPA/industry discussions on the most crucial elements of the Program (i.e., the definitions and specifications), EPA has provided this brief draft specification as opposed to a complete agreement. However, the draft and final versions of the agreement will have all of the standard sections of an ENERGY STAR agreement, including "Common Agreements and Principles," "Entry Into Force and Duration," "Use of the ENERGY STAR Logo and Name," "Conflict Resolution," etc.

As noted above, the effective date and the duration of the agreement will be negotiated with industry. Please note that specifications for existing programs have remained in effect for two to four years before being replaced with new specifications to reflect market and/or technology changes. As always, EPA welcomes comments or alternative proposals from industry that address these issues. EPA deems industry feedback crucial to the successful development of ENERGY STAR Programs.